CLAIMS

The embodiments of an invention in which an exclusive property or right is claimed are defined as follows:

1. A method for determining dissolved oxygen utilizing an oxygen probe, said method comprising the steps of:

passing a constant current though a working electrode to establish a reference electrode voltage relative to said working electrode;

measuring said reference electrode voltage at a first current level and at a second current level utilizing said oxygen probe, wherein said first and second current levels define limitations of oxygen electrochemistry; and

calculating an optimum electrode bias voltage based on said reference electrode voltage measured at said first current level and said second level to thereby indicate dissolved oxygen thereof.

2. The method of claim 1 wherein said constant current level comprises at least one predefined current level, wherein said at least one predefined current level is passed through said working electrode to establish said reference electrode voltage relative to said working electrode.

3. The method of claim 1 further comprising the step of:

configuring said oxygen probe to include at least one amplifier, which provides a constant current source sufficient to place said oxygen probe in said constant current mode.

4. The method of claim 2 wherein said at least one amplifier comprises a transconductance amplifier.

5. The method of claim 1 further comprising the step of:

configuring said oxygen probe to comprise at least two resistors electrically in parallel with another;

connecting at least one of said at least two resistors to at least one amplifier;

coupling at least one of said at least two resistors to a cathode;

connecting an output of said at least one amplifier to an anode.

6. The method of claim 5 further comprising the step of:

connecting an input of at least one amplifier to a reference electrode.

7. The method of claim 5 wherein said cathode comprises a working electrode.

8. The method of claim 1 further comprising the step of:

determining said limitations of oxygen electrochemistry by determining limitations of an oxygen reduction wave measured utilizing said oxygen probe.

9. The method of claim 8 further comprising the step of:

determining limitations of said oxygen reduction wave by compiling a voltage window of said oxygen reduction wave, wherein said voltage window is compiled based on measured voltage and current values known to be a fraction of a limiting current.

10. The method of claim 8 further comprising the step of:

determining limitations of said oxygen reduction wave by compiling a voltage window of said oxygen reduction wave, wherein said voltage window is compiled based on measured voltage and current values known to exceed at least one limiting current value.

11. The method of claim 1 wherein said oxygen probe comprises a dissolved oxygen (DO) probe for measuring oxygen dissolved in a fluid.

12. The method of claim 1 wherein the step of calculating an optimum electrode bias voltage based on said reference electrode voltage measured at said first current level and said second level to thereby provide accurate indications of dissolved oxygen thereof, further comprises the step of:

automatically calculating said optimum electrode bias, in response to measuring said reference electrode voltage at said first current level and at said second current level utilizing said oxygen probe.

13. The method of claim 1 further comprising the step of:

configuring said oxygen probe and electronics associated therewith, such that said oxygen probe performs normal dissolved oxygen (DO) measurement in a constant voltage mode.

14. The method of claim 1 further comprising the step of:

adjusting said constant current level to account for temperature effects associated with said dissolved oxygen probe and a constant current selection value.

15. The method of claim 1 further comprising the step of:

maintaining said constant current level at a single current level.

16. A method for determining dissolved oxygen utilizing a dissolved oxygen probe, said method comprising the steps of:

passing a constant current though a working electrode to establish a reference electrode voltage relative to said working electrode, wherein said constant current level comprises at least one predefined current level;

measuring said reference electrode voltage at a first current level and at a second current level utilizing said dissolved oxygen probe, wherein said first and second current levels define limitations of oxygen electrochemistry; and

calculating an optimum electrode bias voltage based on said reference electrode voltage measured at said first current level and said second level to thereby provide accurate indications of dissolved oxygen thereof;

configuring said dissolved oxygen probe to include at least one amplifier, which provides a constant current source sufficient to place said dissolved oxygen probe in said constant current mode, wherein said at least one amplifier comprises a transconductance amplifier; and

adjusting said constant current level to account for temperature effects associated with said dissolved oxygen probe and a constant current selection value.

17. A system for determining dissolved oxygen utilizing an oxygen probe, said system comprising:

a current mechanism for passing a constant current though a working electrode to establish a reference electrode voltage relative to said working

electrode;

a measurement mechanism for measuring said reference electrode voltage at a first current level and at a second current level utilizing said oxygen probe, wherein said first and second current levels define limitations of oxygen electrochemistry; and

a calculating mechanism for calculating an optimum electrode bias voltage based on said reference electrode voltage measured at said first current level and said second level to thereby provide accurate indications of dissolved oxygen thereof.

18. The system of claim 17 wherein said constant current level comprises at least one predefined current level, wherein said at least one predefined current level is passed through said working electrode to establish said reference electrode voltage relative to said working electrode.

19. The system of claim 17 wherein said oxygen probe comprises at least one amplifier, which provides a constant current source sufficient to place said oxygen probe in said constant current mode.

20. The system of claim 19 wherein said at least one amplifier comprises a transconductance amplifier.

21. The system of claim 17 further comprising:

said oxygen probe comprising at least two resistors electrically in parallel with another;

at least one of said at least two resistors connected to at least one amplifier;

at least one of said at least two resistors coupled to a cathode; and

an output of said at least one amplifier connected to an anode.

22. The system of claim 21 wherein an input of at least one amplifier is connected to a reference electrode.

23. The system of claim 21 wherein said cathode comprises a working electrode.

24. The system of claim 17 further comprising wherein said limitations of oxygen electrochemistry are determined by determining limitations of an oxygen reduction wave measured utilizing said oxygen probe.

25. The system of claim 24 wherein limitations of said oxygen reduction wave are determined by compiling a voltage window of said oxygen reduction wave, wherein said voltage window is compiled based on measured voltage and current values known to be a small fraction of a limiting current.

26. The system of claim 24 wherein said limitations of said oxygen reduction wave are determined by compiling a voltage window of said oxygen reduction wave, wherein said voltage window is compiled based on measured voltage and current values known to exceed at least one limiting current value.

27. The system of claim 17 wherein said oxygen probe comprises a dissolved oxygen (DO) probe for measuring oxygen dissolved in a fluid.

28. The system of claim 17 wherein said calculating mechanism further comprises:

a calculating mechanism for automatically calculating said optimum electrode bias, in response to measuring said reference electrode voltage at

said first current level and at said second current level utilizing said oxygen probe.

29. The system of claim 17 wherein said oxygen probe and electronics associated therewith are configured such that said oxygen probe performs normal dissolved oxygen (DO) measurement in a constant voltage mode.

30. The system of claim 17 further comprising:

an adjusting said constant current level to account for temperature effects associated with said dissolved oxygen probe and a constant current selection value.

31. The system of claim 17 wherein said constant current level is maintained at a single current level.

32. A system for determining dissolved oxygen utilizing a dissolved oxygen probe, said system comprising:

a current device, wherein said current device passes a constant current though a working electrode to establish a reference electrode voltage relative to said working electrode, wherein said constant current level comprises at least one predefined current level;

a measuring device, wherein said measuring device measures said reference electrode voltage at a first current level and at a second current level utilizing said dissolved oxygen probe, wherein said first and second current levels define limitations of oxygen electrochemistry; and

a calculating device, wherein said calculating device calculates an optimum electrode bias voltage based on said reference electrode voltage measured at said first current level and said second level to thereby provide

accurate indications of dissolved oxygen thereof;

said dissolved oxygen probe comprising at least one amplifier, which provides a constant current source sufficient to place said dissolved oxygen probe in said constant current mode, wherein said at least one amplifier comprises a transconductance amplifier; and

an adjusting mechanism for adjusting said constant current level to account for temperature effects associated with said dissolved oxygen probe and a constant current selection value.